

AZT Review Key for Q2 T1

1)
$$\frac{(a^2b^2) \frac{1}{a^2} - \frac{1}{b^2} (a^2b^2)}{(a^2b^2) \frac{1}{b} + \frac{1}{a} (a^2b^2)} = \frac{b^2 - a^2}{a^2b + ab^2} = \frac{(b+a)(b-a)}{ab(b+a)} = \frac{b-a}{ab} \quad \boxed{B}$$

LCD: $\frac{a^2b^2}{a^2b^2}$

2)
$$\frac{2x+3}{5} = \frac{x+6}{4} \quad 4(2x+3) = 5(x+6)$$

$$8x+12 = 5x+30$$

$$\begin{array}{r} -5x-12 \\ \hline 3x = 18 \end{array}$$

$x=6 \quad \boxed{D}$

3)
$$\frac{3x+2}{3x+2} = \frac{x+4}{2x+9} \quad (3x+2)(2x+9) = (3x+2)(x+4)$$

$$6x^2+27x+4x+18 = 3x^2+12x+2x+8$$

$$6x^2+31x+18 = 3x^2+14x+8$$

$$\begin{array}{r} -3x^2-14x-8 \\ \hline 3x^2+17x+10 = 0 \end{array}$$

$$(3x+2)(x+5) = 0$$

$x = -\frac{2}{3}$ reject $x = -5 \quad \boxed{C}$

4)
$$\frac{2x}{3} - \frac{4}{x} = \frac{5}{3}$$

LCD: $\frac{3x}{3x}$

$$2x^2 - 12 = 5x$$

$$2x^2 - 5x - 12 = 0$$

$$2x^2 - 8x + 3x - 12 = 0$$

$$2x(x-4) + 3(x-4) = 0$$

$$(x-4)(2x+3) = 0$$

$x=4 \quad x = -\frac{3}{2}$

\boxed{A}

LCD:
 $(x-4)(x+3)$

5) $\frac{x \cancel{(x-4)} \cancel{(x+3)}}{\cancel{x-4} \cancel{x+3}} - \frac{1 \cancel{(x-4)} \cancel{(x+3)}}{\cancel{x+3}} = \frac{28 \cancel{(x-4)} \cancel{(x+3)}}{(x+3)(x-4)}$

restrictions
 $x \neq 4, -3$

$$x(x+3) - 1(x-4) = 28$$

$$x^2 + 3x - x + 4 = 28$$

$$x^2 + 2x + 4 = 28$$

$$-28 - 28$$

$$x^2 + 2x - 24 = 0$$

$$(x+6)(x-4)$$

$$x = -6$$

$$x = 4$$

restriction

$$\boxed{B}$$

LCD:
 $2(c+3)(c-3)$
 $c \neq 3, -3$

6) $\frac{c+1 \cancel{2} \cancel{(c+3)} \cancel{(c-3)}}{\cancel{2} \cancel{(c+3)} \cancel{(c-3)}} - \frac{9 \cancel{2} \cancel{(c+3)} \cancel{(c-3)}}{\cancel{(c+3)} \cancel{(c-3)}} = \frac{c-2 \cancel{2} \cancel{(c+3)} \cancel{(c-3)}}{\cancel{2} \cancel{(c-3)}}$

$$(c+1)(c-3) - 18 = (c-2)(c+3)$$

$$c^2 - 2c - 3 - 18 = c^2 + c - 6$$

$$\cancel{c^2} - 2c - 21 = \cancel{c^2} + c - 6$$

$$\cancel{-c^2} - c + 6 \quad \cancel{-c^2} - c + 6$$

$$-3c - 15 = 0$$

$$+15 \quad +15$$

$$-3c = 15$$

$$\frac{-3}{-3} = \frac{15}{-3}$$

$$\boxed{c = -5}$$

$$7) |x+1|=5$$

$$\begin{array}{r} x+1=5 \\ -1 \quad -1 \\ \hline x=4 \end{array}$$

✓

D

$$\begin{array}{r} x+1=-5 \\ -1 \quad -1 \\ \hline x=-6 \end{array}$$

✓

$$8) |3x-1|=x+5$$

$$\begin{array}{r} 3x-1=x+5 \\ -x+1 \quad -x+1 \\ \hline 2x=6 \end{array}$$

$$x=3$$

✓

C

$$\begin{array}{r} 3x-1=-x-5 \\ +x+1 \quad +x+1 \\ \hline 4x=-4 \end{array}$$

$$x=-1$$

✓

$$9) |3y+2|+4=2$$

$$\begin{array}{r} -4 \quad -4 \\ \hline \end{array}$$

$$|3y+2|=-2$$

↑

$$y=\emptyset$$

Absolute Value is not negative

$$10) |3x-1|=5$$

$$3x-1=5$$

$$\begin{array}{r} +1 \quad +1 \\ \hline \end{array}$$

$$3x=6$$

$$x=2$$

✓

$$3x-1=-5$$

$$\begin{array}{r} +1 \quad +1 \\ \hline \end{array}$$

$$3x=-4$$

$$x=-\frac{4}{3}$$

✓

$$11) |3x+6| \leq 30 \quad \swarrow \text{AND}$$

$$\begin{array}{r} 3x+6 \leq 30 \\ -6 \quad -6 \\ \hline \end{array}$$

$$3x \leq 24$$

$$x \leq 8$$

$$\begin{array}{r} 3x+6 \geq -30 \\ -6 \quad -6 \\ \hline \end{array}$$

$$3x \geq -36$$

$$x \geq -12$$

C

$$12) |x-3| > 5 \quad \swarrow \text{OR}$$

$$\begin{array}{r} x-3 > 5 \\ +3 \quad +3 \\ \hline \end{array}$$

$$x > 8$$

$$\begin{array}{r} x-3 < -5 \\ +3 \quad +3 \\ \hline \end{array}$$

$$x < -2$$

D

$$13) |5x-15| < 10 \quad \swarrow \text{AND}$$

$$\begin{array}{r} 5x-15 < 10 \\ +15 \quad +15 \\ \hline \end{array}$$

$$5x < 25$$

$$x < 5$$

$$\begin{array}{r} 5x-15 > -10 \\ +15 \quad +15 \\ \hline \end{array}$$

$$5x > 5$$

$$x > 1$$



$$-\frac{4}{2} = -2$$

$$(-2)^2 = 4$$

$$14) y^2 = 4y + 9$$

$$y^2 = 4y + \boxed{4} = 9 + \boxed{4}$$

$$(y-2)^2 = 13$$

$$\pm \sqrt{(y-2)^2} = \pm \sqrt{13}$$

$$y-2 = \pm \sqrt{13}$$

$$\begin{array}{cc} +2 & +2 \end{array}$$

$$\boxed{B} \quad y = 2 \pm \sqrt{13}$$

$$15) x^2 - 6x - 5 = 0$$

$$x^2 - 6x + \boxed{9} = 5 + \boxed{9}$$

$$-\frac{6}{2} = -3$$

$$(-3)^2 = 9$$

$$(x-3)^2 = 14$$

$$\pm \sqrt{(x-3)^2} = \pm \sqrt{14}$$

$$x-3 = \pm \sqrt{14}$$

$$\begin{array}{cc} +3 & +3 \end{array}$$

$$\boxed{x = 3 \pm \sqrt{14}}$$

$$-\frac{7}{2} = -\frac{7}{2}$$

$$\left(-\frac{7}{2}\right)^2 = \frac{49}{4}$$

$$16) y^2 - 7y + 4 = 0$$

$$y^2 - 7y + \frac{49}{4} = -4 + \frac{49}{4}$$

$$\pm \sqrt{\left(y - \frac{7}{2}\right)^2} = \pm \sqrt{\frac{33}{4}}$$

$$y - \frac{7}{2} = \pm \frac{\sqrt{33}}{2}$$

$$\begin{array}{cc} +\frac{7}{2} & +\frac{7}{2} \end{array}$$

$$\boxed{y = \frac{7}{2} \pm \frac{\sqrt{33}}{2}}$$

$$17) x^2 - 4x - 1 = 0$$

$$x = \frac{4 \pm \sqrt{(-4)^2 - 4(1)(-1)}}{2(1)}$$

$$x = \frac{4 \pm \sqrt{20}}{2} = \frac{4 \pm 2\sqrt{5}}{2}$$

$$x = 2 \pm \sqrt{5}$$

$$\boxed{A}$$

$$18) 2x^2 - 7x + 4 = 0$$

$$a=2 \quad b=-7 \quad c=4$$

$$x = \frac{-(-7) \pm \sqrt{(-7)^2 - 4(2)(4)}}{2(2)} = \frac{7 \pm \sqrt{17}}{4}$$

\boxed{C} is the positive root

$$19) 2x^2 - 6x + 3 = 0$$

$$a = 2$$

$$b = -6$$

$$c = 3$$

$$x = \frac{-(-6) \pm \sqrt{(-6)^2 - 4(2)(3)}}{2(2)} = \frac{6 \pm \sqrt{12}}{4} = \frac{6 \pm 2\sqrt{3}}{4} = \frac{3 \pm \sqrt{3}}{2}$$

D

$$20) 2(x^2 - 1) = 3x$$

$$2x^2 - 2 = 3x$$

$$2x^2 - 3x - 2 = 0$$

$$a = 2$$

$$b = -3$$

$$c = -2$$

$$x = \frac{-(-3) \pm \sqrt{(-3)^2 - 4(2)(-2)}}{2(2)}$$

$$x = \frac{3 \pm \sqrt{25}}{4} = \frac{3 \pm 5}{4}$$

$$\frac{3+5}{4} = \boxed{2}$$

$$\frac{3-5}{4} = \boxed{-\frac{1}{2}}$$

LCD:
w

$$21) (w)2w = \frac{4(w)}{w} + 5(w)$$

$$2w^2 = 4 + 5w$$

$$2w^2 - 5w - 4 = 0$$

$$a = 2$$

$$b = -5$$

$$c = -4$$

$$w = \frac{-(-5) \pm \sqrt{(-5)^2 - 4(2)(-4)}}{2(2)}$$

$$w = \boxed{\frac{5 \pm \sqrt{57}}{4}}$$

$$22) x^2 - 3x + 7 = 0$$

$$a = 1$$

$$b = -3$$

$$c = 7$$

$$x = \frac{-(-3) \pm \sqrt{(-3)^2 - 4(1)(7)}}{2(1)} = \frac{3 \pm \sqrt{-19}}{2} = \frac{3 \pm i\sqrt{19}}{2}$$

A

$$23) x^2 + 6x + 12 = 0$$

$$a = 1$$

$$b = 6$$

$$c = 12$$

$$x = \frac{-6 \pm \sqrt{6^2 - 4(1)(12)}}{2(1)} = \frac{-6 \pm \sqrt{-12}}{2}$$

$$x = \frac{-6 \pm 2i\sqrt{3}}{2} = \boxed{-3 \pm i\sqrt{3}} \text{ (D)}$$

$$24) (5 + \sqrt{-36})(1 - \sqrt{-49})$$

$$(5 + 6i)(1 - 7i) = 5 - 35i + 6i - 42i^2 \quad i^2 = (-1)$$

$$5 - 29i + 42$$

$$47 - 29i$$

$$\boxed{C}$$

$$25) \begin{array}{rcl} \sqrt{2x-5} & +3 & =6 \\ -3 & -3 & \end{array}$$

$$(\sqrt{2x-5})^2 = (3)^2$$

$$2x - 5 = 9$$

$$\begin{array}{rcl} +5 & +5 & \\ \hline \end{array}$$

$$\frac{2x}{2} = \frac{14}{2}$$

$$\boxed{x=7} \checkmark$$

$$26) \frac{(x-5)(x+5)}{2(x+6)} \cdot \frac{(x+2)(x+6)}{4(x-5)} \cdot \frac{\cancel{2x}}{\cancel{8x}} = \boxed{\times}$$

$x \neq -6, 5, 0, -2, -5$

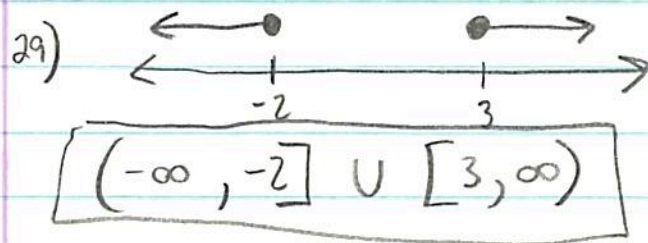


③ $[-4, 1]$

28) $(-\infty, 0) \cup (9, \infty)$

$\leftarrow 0 \qquad 9 \rightarrow$
 $\leftarrow 0 \qquad 0 \rightarrow$

\boxed{C}



30) $\frac{2x^2}{2} - \frac{12x}{2} + \frac{4}{2} = 0$

$$x^2 - 6x + 2$$

$$x^2 - 6x + \boxed{9} = -2 + \boxed{9}$$

$$-\frac{6}{2} = -3$$

$$(x-3)^2 = 7$$

$$(-3)^2 = 9$$

$$\pm \sqrt{(x-3)^2} = \pm \sqrt{7}$$

$$x-3 = \pm \sqrt{7}$$

$$\boxed{x = 3 \pm \sqrt{7}}$$